

Application Serial No. 10/738,394
Reply to Office Action of October 6, 2004

PATENT
Docket: CU-3494

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 1-10 are pending in the present application before this amendment. By the present amendment, Claim 1 has been amended. No new matter has been added.

Claims 1, 3-6, and 8-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,599,736 (Tseng). The "et al." suffix, which may appear after a reference name, is omitted in this paper.

The present invention is directed to solving, inter alia, problems related to tWR (write recovery time) margin failure in a semiconductor device due to insufficient cell current. The prior art solution suggested (1) increasing doping concentration of the plugs or (2) performing an ion implantation process after forming the plugs (Specification page 1, lines 18-21). To do so, the prior art solution requires a rapid thermal annealing process be performed before forming plugs; however, this does not contribute to the sufficiently increasing the cell current because the out-diffusion effect from the plug is insignificant (Specification page 1, line 22 to page 2, line 1).

In contradistinction, a rapid thermal annealing process is not carried out to anneal the plug material (such as the polysilicon material) before forming the plugs (105a, 150b) in the contact holes in the presently claimed invention. That is, the plug material such as a polysilicon material is not annealed before the step of forming the plugs in the contact holes, and as such Claim 1 has been amended. This is well supported in the Specification page 4, lines 14-15; and page 7, Table 1, "First RTA process".

This feature (in conjunction with various other features) of the presently claimed

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invention provides a solution to the problem unsolved by prior art, leading to the 40-50% increase of cell currents, as this is well described in the Specification pages 7-8.

Tseng's teachings relate to the prior art techniques and do not anticipate Claim 1, as amended. In particular, Tseng, in col. 4, lines 13-41, teaches that the "material in contact hole 9" is annealed (as in Tseng FIGS. 4-5) **before** the contact plug such as 10 is formed in the contact hole 9 (as in Tseng FIG. 6). Thus, Tseng cannot teach the solutions provided by the presently claimed invention and is considered to be substantially different from the presently claimed invention.

The both cited Akamatsu and Wang reference fails to disclose this aspect of the presently claimed.

For the reasons set forth above, Applicants respectfully submit that Claims 1-10, pending in this application, are in condition for allowance over the cited references. This amendment is considered to be responsive to all points raised in the Office Action. Accordingly, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

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Should the Examiner have any remaining questions or concerns, the Examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,



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